AIO

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Easing heavy tracker actions

by Joseph Chapline

A recent contract presented me with an old tracker organ, rebuilt by Hilbourne Roosevelt late in the 19th century. It was a two manual and pedal organ, the pedals having been converted to electric action but the manuals were still tracker. The wind pressure was about 75mm (3"). The action weight varied from bass to treble but measured anywhere from 350 to 500 grams per key. It was known as the heaviest organ action in the city.

We replaced the enitre action system: new trackers, new keyboards, new rollerboards. We tried lightening the pallet springs but found the pallets didn't always seat reliably.

I asked among the better known experts in the area of tracker action and got several suggestions such as cutting the felt-leather of the pallet so that the edges of the pallet were closer to the pallet opening. This didn't help. I went to the mid-winter conference on tracker action in Texas; I didn't find an answer there. I knew of other old tracker action organs that had been rebuilt and the action was pleasantly easy.

One day, I took the table I use to compute the size of pallets needed for a chest given the particular stops on it. I computed for the bottom note on the Great manual. The result was a pallet opening of 200 mm by 10 mm (8" by 3/8"). The pallet on that note in the organ was 360 mm by 25 mm (14" by 1"). The trouble was that the pallets were grossly oversized. The construction of the old chest was such that the pallet width was determined by the space left between the dividers (which were themselves about 25 mm (1") thick) and the space needed to plant the largest stop on that note. The length of the pallet was determined by a "seat of the pants" formula which made the pallet at least large enough!

I then measured the centers for each pallet on both chests, went back to the shop and made "pallet boards" for each chest. I made five boards- one for each octave- for each chest out of 6 mm Baltic plywood each carrying 12 notes. I routed out new pallet slots (10 mm by 200 mm) on the same centers. I inserted new pallet pins at the front and back of the new pallet slots and then installed new pallets on each note. I used small leather washers pushed down on the pallet pins to keep the pallets in place.

I then returned to the organ, removed the old pallets, their pins and cleaned out the dirt. I then squeezed silastic int he upper side of the new pallet boards- all arount each pallet opening- so as to ensure a totally air tight bond around each pallet opening. Then I inserted each new pallet board into the chest and squooched it into place being careful to locate it properly sideways and front to back.

After the silastic had had a chance to set, the old springs were reinserted and

the pulldowns were reconnected. Because the organ had to be playable on each sunday, I had to put the spring tension high in order to seat the pallets. It was not until some time had passed and the new pallets had seated themselves, that I was able to go back and reduce the spring tension. When I did, I was able to achieve key weights of 80-100 grams throughout the manual.

What occured to me after doing this work is that most such older organs, when rebuilt, are totally dismantled, with the pipes and chests going back to the shop for rebuilding. In the course of that rebuilding the pallets are replaced with ones of properly computed size. Therefore, the new action is light. The contract I had for this organ stated that the organ had to be useable each Sunday and therefore all of the work was done "in situ". The principal reason for this restriction was that the Rector could not approve an amount of money over a certain limit and that limit was not enough to pay the costs of total removal of the organ. It was done in five contracts within the Rector's allowance.

From this experience I learned that engineering took a great step forward with the invention of the aircraft. Up until that time, bridges, for example, could be built ten times stronger than needed without concern. The only interest was that the bridge didn't fall down. Likewise with buildings. Only occasionally did they build a structure that was beyond the structural limits and they they had a collapse. But with building aircraft, one must build something that is strong enough to hold together yet not so heavy that it can't get off the ground. The organ for centuries has been built much stronger that was really needed and in general there was not much calculation to meet aircraft-type minimums and maximums. The pipe organ also now comes under the same type of maximum-minimum limitations. It is sufficient to build no stronger than needed and at least strong enough to keep together. Organ technology has moved from the "Build it good and strong" to "Build it strong enough but no more".

Chris Nagorka adds: While I agree with the premise of what Mr. Chapline states here, I have to say I totally disagree with the use of an adhesive in the way described. At this point in organ history, I would say that all changes to historic instruments should be reversible, whether we think the engineering is correct or not. Using a leather gasketed pallet board would be much more appropriate, in my opinion. Also, while I understand the idea of not wasting material to make organ structures and engineering overdone, it should be pointed out that the older organs are many times more desireable for moving and relocation than many organs from the '50s, '60s and '70s, due to the fact that they were built more heavliy. After all, when was the last time you saw a collapsing pipe foot or sagging miter in an organ from the late 1800s/early 1900s?

Tom Cashen adds: Pallet geometry is a critical factor in the response of a mechanical action and should be evaluated first when considering a re-actioning project focused on improving (usually lightening) the touch. While pallets can range anywhere from wide and short to narrow and long, the laws of physics (to my knowledge) have not changed much in the last 400 years. Upon a determination that corrections in the pallet geometry will improve the action, the client should be made aware of the impact such a project will have on the historical integrity of the instrument. As is often the case, budget

constraints and the desire to have the organ playing every sunday conspire to test the boundaries of good organ building practice- which demands that creative (and heroic) solutions as described above are only excecuted 1: by those with sufficient knowledge and expericence to do so, and 2: when the client is made aware of the possible compromises involved and 3: no other course is available.